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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/045,911	10/19/2001	Salvatore Nicholas Storino	ROC920010285US1	1410

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EXAMINER
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SUN, XIUQIN

ART UNIT	PAPER NUMBER
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2863

DATE MAILED: 12/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/045,911

Applicant(s)

STORINO, SALVATORE  
NICHOLAS

Examiner

Xiuqin Sun

Art Unit

2863

AW

-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on 09/22/2003.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-4,6-15 and 18-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 19-21 is/are allowed.
- 6) ☒ Claim(s) 1-4,6-15 and 18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All   b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)                      4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)                      5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_                      6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Flanagan et al. (U.S. Pub. No. 2003/0014150 A1) in view of Kou (U.S. Pub. No. 2003/0030429 A1).

Flanagan et al. teach an apparatus that provides at least one estimated effective age of a product (sections 0009 and 0010), comprising: at least one sensor equipped on the product that provides data about the operating condition of said product (sections 0025 and 0029); a device equipped on the product that uses said data to calculate an age acceleration factor for said product for at least one of said sensors (sections 0009 and 0027-0029); at least one accumulator equipped on the product that provides the estimated effective age for said product, based upon said age acceleration factor (sections 0009 and 0027-0029); and a display capable of presenting said estimated effective age to a user of said product (sections 0031 and 0032). Flanagan et al. also teach a method for producing one or more estimates of effective age of a product, during the entire life of the product (Abstract; sections 0009 and 0010), comprising the steps of: sensing, using a sensor equipped on the product, one or more operating

Art Unit: 2863

conditions (sections 0025 and 0029); computing, using a computer equipped on the product, an age acceleration factor for each of the operating conditions sensed, using a model that relates the operating condition to the age acceleration factor (sections 0009 and 0027-0029); computing, using the computer equipped on the product, effective age values, using said acceleration factors (sections 0009 and 0027-0029); storing, using a storage equipped on the product, said effective age values into nonvolatile storage (sections 0027-0029); and displaying said effective age values to a user of said product on a display (sections 0031 and 0032). Flanagan et al. further teach: said device that uses said data to calculate an age acceleration factor is a digital processor (sections 0027-0029); said accumulator is at least partially implemented in memory storage (sections 0027-0029).

Flanagan et al. do not mention explicitly that: said sensor provides data about an environmental condition; said computer computes an age acceleration factor for each of the environmental conditions sensed, using a model that relates the environmental condition to the age acceleration factor; and said display is equipped on the product.

Kou teaches an apparatus that provides at least one estimated effective age of a product (abstract; sections 0003-0005), comprising: at least one sensor that provides data about an environmental condition (sections 0015, 0023, 0044, and 0076); a computing device that computes an age acceleration factor for each of the environmental conditions sensed, using a model that relates the environmental condition to the age acceleration factor (sections 0044, 0048-0056, and 0070-0072).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the teachings of Kou environmental condition sensor and the computing device in the Flanagan apparatus and method in order to include the impact of environmental conditions in estimating the effective age of said product (Flanagan et al., section 0025; Kou, section 0023 and 0044).

It would also have been obvious to one of ordinary skill in the art at the time the invention was made to mount the display on the product, together with the Flanagan computing device, in order to make it easier and more efficient to monitor the remaining lifetime of said product, since it is a well known technology in the art that a display terminal can be attached to a microcomputer. It is held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70 (CCPA 1950).

3. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Flanagan et al. in view of Kou, as applied to claim 1 above, and further in view of Ramamurthi (U.S. Pat. No. 5251144).

Flanagan et al. and Kou teach the apparatus and method that includes the subject matter discussed above. Flanagan et al. and Kou do not mention explicitly that: said sensor includes an analog to digital conversion function.

Ramamurthi discloses a system for predicting the life of a cutting tool, and teaches: a plurality of sensors that include an analog to digital conversion function (col. 4, lines 1-19).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the teaching of Ramamurthi analog to digital converter in

the apparatus and method of Flanagan et al. and Kou in order to convert the sensed analog signals to digital signals so that the signals can be processed by the digital computer (Ramamurthi, col. 4, lines 1-19).

3. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Flanagan et al. in view of Kou, and further in view of Ramamurthi, as applied to claims 1 and 2 above, and further in view of Talbott (U.S. Pat. No.6411908).

Flanagan et al, Kou and Ramamurtui et al. teach the apparatus and method that includes the subject matter discussed above, but do not mention explicitly that: said digital processor is programmed to compute a Coffin-Manson estimate of said age acceleration.

Talbott teaches using a Coffin-Manson equation to calculate an estimate of the remaining life of an electronic component as a function of environment conditions (col. 2, lines 7-23).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the teaching of Talbott Coffin-Manson equation in the combination of Flanagan et al., Kou and Ramamurthi et al. in order to provide a "predetermined life equation" to compute an estimate of said age acceleration (Talbott, abstract and col. 2, lines 7-23).

4. Claims 6-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Flanagan et al. in view of Kou, and further in view of Ramamurthi et al., as applied to claims 1 and 2 above, and further in view of Kon (U.S. Pat. No. 6249838 B1) and Kaehler et al. (U.S. Pat. No. 6092410).

Flanagan et al., Kou and Ramamurti et al. teach the apparatus and method that includes the subject matter discussed above, but do not mention explicitly that: said accumulator is at least partially implemented in nonvolatile storage; said nonvolatile storage is a ferroelectric memory; said nonvolatile storage is a flash memory; said nonvolatile storage is a hard disk; said nonvolatile storage is a volatile memory element, with continuity of power provided by a battery.

Kon teaches storing "remaining-expected-lifetime" information of a product in nonvolatile storage, said nonvolatile storage is a flash memory; said nonvolatile storage is a hard disk; said nonvolatile storage is a volatile memory element, with continuity of power provided by a battery (col. 8, lines 21-60).

Kaehler et al. further teach various types of nonvolatile storage, including a ferroelectric memory (col. 4, lines 39-56).

~ It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the teachings of Kon and Kaehler et al. in the combination of Flanagan et al., Kou and of Ramamurthi et al. in order to facilitate the access of the stored data and also to achieve a degree of confidence in the continued operation of the system (Kon, col. 1, lines 13-30 and Kaehler et al., col. 4, lines 44-48).

5. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Flanagan et al. in view of Kou, as applied in claim 1 above, and further in view of Kuwabara (JP05264371, English translation).

Flanagan et al. and Kou teach the apparatus and method that includes the subject matter discussed above. Flanagan et al. and Kou do not mention explicitly that:

Art Unit: 2863

said sensor produces an analog voltage output, said analog voltage output varying substantially linearly responsive to a change in temperature, wherein said voltage output is said data.

Kuwabara teaches a temperature sensing device, wherein a sensor produces an analog voltage output, said analog voltage output varying substantially linearly responsive to a change in temperature, wherein said voltage output is digital data (see Abstract).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the teaching of Kuwabara in the apparatus of Flanagan et al. and Kou in order to digitally analyze the sensed data based on voltage outputs (Kuwabara, Abstract).

6. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Flanagan et al. in view of Kou, as applied to claim 15 above, and further in view of Grimm (U.S. Pub. No. 2002/0107589 A1).

Kou teaches the system and method that includes the subject matter discussed above. Kou does not mention explicitly that: said step of displaying said effective age values further comprises the steps of: determining if any of said values are outside of predetermined ranges; and alerting the user if any of said values are outside of predetermined ranges by lighting a light, sounding an audible alarm, or presenting said values on said display.

Grimm discloses a method and device for determining changes in technical systems, and teaches the step of displaying effective age values of the systems which



Art Unit: 2863

further comprises the steps of: determining if any of said values are outside of predetermined ranges (section 0033); and alerting the user if any of said values are outside of predetermined ranges by lighting a light, sounding an audible alarm, or presenting said values on said display (section 0009).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the teaching of Grimm in the system of Kou in order to provide a more efficient means for displaying the result of said computations (Grimm, section 0009).

#### ***Allowable Subject Matter***

7. Claims 3 and 12-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. Claims 19-21 are allowed.

#### ***Reasons for Allowance***

9. The following is an examiner's statement of reasons for allowance:

The primary reason for the allowance of claim 3 is the inclusion of the limitation that said digital processor is programmed to compute an Arrhenius estimate of said age acceleration. It is this limitation found in the claim, as it is claimed in the combination, that has not been found, taught or suggested by the prior art of record which makes the claim allowable over the prior art.

The primary reason for the allowance of claims 12-14 is the inclusion of the limitation that said device that uses said data to calculate an age acceleration factor for said product is a VCO, said VCO producing a VCO output signal having a frequency that varies substantially exponentially responsive to a linear voltage change on an input of the VCO. It is this limitation found in each of the claims, as it is claimed in the combination, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

The primary reason for the allowance of claim 19 is the inclusion of the limitation that said digital processor is programmed to compute a Hallberg-Peck estimate of age acceleration. It is this limitation found in the claim, as it is claimed in the combination, that has not been found, taught or suggested by the prior art of record which makes the claim allowable over the prior art.

The primary reason for the allowance of claim 20 is the claimed step of computing an age acceleration factor that comprises the use of the Arrhenius equation, the Hallberg-Peck equation, or the Coffin-Manson equation. It is this step found in the claim, as it is claimed in the combination, that has not been found, taught or suggested by the prior art of record which makes the claim allowable over the prior art.

The primary reason for the allowance of claim 21 is the claimed steps of: computing a normalized effective age for some or all of the effective ages by dividing the instant effective age by a wall clock age; computing an effective life used value for some or all of the effective ages by dividing the instant effective age by a predetermined estimate of life of the product; and computing an effective life remaining value for some

or all of the effective ages by subtracting said effective life used value from "1 ". It is these steps found in the claim, as they are claimed in the combination, that have not been found, taught or suggested by the prior art of record which make the claim allowable over the prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Conclusion***

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

***Response to Arguments***

11. Applicant's arguments with respect to claims 1, 2, 4, 6-11, 15 and 18 have been considered but are moot in view of the new ground(s) of rejection.

Claims 1, 2, 4, 6-11, 15 and 18 are rejected as new art (Flanagan et al., U.S. Pub. No. 2003/0014150 A1; Kuwabara, JP05264371) has been found to teach or suggest continued lifetime estimation upon shipment to a customer and operation by the customer of an assembled electronic system under power and/or in storage during normal use by the customer. For more detailed response, please refer to sections 2 and 5 set forth above in this Office Action.

***Contact Information***

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Xiuqin Sun whose telephone number is (703)305-3467. The examiner can normally be reached on 7:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (703)308-3126. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9318.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

Xiuqin Sun

Application/Control Number: 10/045,911  
Art Unit: 2863

Page 12

Examiner  
Art Unit 2863



XS

November 19, 2003



John Barlow  
Supervisory Patent Examiner  
Technology Center 2800